UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P O Box 1450
Alexandria, Virginia 22313-1450
www uspto gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/533,385	04/28/2005	Sung-Hee Park	51876P846	5066

8791 7590 06/02/2009
BLAKELY SOKOLOFF TAYLOR & ZAFMAN LLP
1279 OAKMEAD PARKWAY
SUNNYVALE, CA 94085-4040

EXAMINER	
RASHID, DAVID	

ART UNIT	PAPER NUMBER
2624	

MAIL DATE	DELIVERY MODE
06/02/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/533,385	PARK ET AL.	
	Examiner	**Art Unit**	
	DAVID P. RASHID	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 April 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *21-32 and 34-38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *21-32 and 34-38* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Table of Contents

Amendments & Claim Status

[1] This office action is responsive to Amendment and Response to Office Action received Apr. 27, 2009. Claims 21-32 and 34-38 remain pending; claim 33 cancelled.

Claim Objections

[2] In response to Amendments to the Claims received Apr. 27, 2009, the previous claim objections are withdrawn.

Response to Arguments

Remarks Unpersuasive regarding Rejections Under 35 U.S.C. § 103

[3] Applicant's Remarks received Apr. 27, 2009 regarding 35 U.S.C. § 103 with respect to claims 21-32 and 34-38 have been respectfully and fully considered, but are not found persuasive.

> Applicants submit that Won is disqualified as a prior art reference. Applicants submit herewith declarations from the three authors of Won, showing that Won is Applicants' own work. The declarations show that two of the three authors of Won are the inventors of the present application. The third author of Won, who is not the inventor of the present application, declares that he did not contribute to the portion of Won that is relevant to the pending claims. Thus, Won is Applicants' own work and, therefore, cannot be used as a prior art reference in the rejection of the pending claims.

> Claim 33 is cancelled. Claims 22-32 and 34-38 depend from amended Claim 21. For at least the same reasons mentioned above, Won cannot be used as a prior art reference in the rejection of these dependent claims. Accordingly, withdrawal of the § 103(a) rejection of Claims 21-38 is requested.

Remarks at 15.

However, M.P.E.P. § 2132.01 titled "Publications as 35 U.S.C. 102(a) Prior Art" cites, in relevant part (emphasis added):

> A prima facie case is made out under 35 U.S.C. 102(a) if, within 1 year of the filing date, the invention, or an obvious variant thereof, is described in a "printed publication" whose authorship differs in any way from the inventive entity unless it is stated within the publication itself that the publication is describing the applicant's work. In re Katz, 687 F.2d 450, 215 USPQ 14 (CCPA 1982).

Won does not explicitly state within the publication itself that the portions of the Won publication relevant to Claims 1-38, or a portion thereof, is describing solely the work of Soo-Jun Park and Chee Sun Won. Nowhere in Won does it restrict particular publisher contributions to be determined that the relevant portions directed to Claims 1-38 were solely contributed by Soo-Jun Park and Chee Sun Won.

In addition, "[a] rejection based on 35 U.S.C. 102(a) can be overcome by:. . .(D) Filing an affidavit or declaration under 37 CFR 1.132 showing that the reference invention is not by "another." See MPEP § 715.01(a), § 715.01(c), and § 716.10;" M.P.E.P. § 706.02(b).

Declaration Under 37 C.F.R. § 1.132 received Apr. 27, 2009 fails to show that the reference invention is not by another. The inventorship of U.S. Patent Application No. 10/533,385 consists of Sung-Hee Park, Soo-Jun Park, Myung-Gil Jang, Sang-Kyu Park, and Chee Won. The declaration amounts to the prior art reference Won (under the relevant portions directed to Claims 1-38) inventorship consisting of Soo-Jun Park and Chee Won. The inventorship is by "another" because these two inventive entities are different (i.e., each composed of a different set of inventors). See § 2132.01 (citing specifically "whose authorship differs in any way from the inventive entity").

Claim Rejections - 35 U.S.C. § 101

[4] 35 U.S.C. § 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

<u>In Re Bilski – "Tied To" Criteria and/or Qualifying "Transformation"</u>

[5] **Claims 21-32** and **34-38** are rejected under 35 U.S.C. § 101 as not falling within one of the four statutory categories of invention. Supreme Court precedent[1] and recent Federal Circuit decisions[2] indicate that a statutory "process" under 35 U.S.C. § 101 must (1) be tied to another statutory category (such as a particular apparatus), or (2) transform underlying subject matter (such as an article or material) to a different state or thing. While the instant claim(s) recite a series of steps or acts to be performed, the claim(s) neither transform underlying subject matter nor positively tie to another statutory category that accomplishes the claimed method steps, and therefore do not qualify as a statutory process.

With regard to (1) above, a process must have either a meaningful tie to an "apparatus", or "machine", or the process must perform a qualifying transformation. Insignificant pre- or post-solution activity involving an "apparatus" or "machine" is not a meaningful tie. For example, claim 1 recites "[a] method for retrieving g a corresponding video sequence. . .from a database" which does not involve a machine to consider whether the machine is significant to the inventive concept (and not pre- or -post processing, or intended use statements). In addition, when such machine is introduced and significant to the inventive concept, it must be a particular machine (e.g., a "processor", not a "machine").

With regard to (2) above, the images in claim 1 do not represent a physical object that has been transformed prior to.

Claims 22-32 and 34-38 are rejected for failing to alleviate the rejection of their respective dependents.

Claim Rejections - 35 U.S.C. § 112

[6] In response to <u>Amendments to the Claims</u> received Apr. 27, 2009, the previous § 112 rejections are withdrawn.

---

1 *Diamond v. Diehr*, 450 U.S. 175, 184 (1981); *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972); *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876).

2 *In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008).

Claim Rejections - 35 U.S.C. § 103

[7] The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Park et al. in view of Won et al.

[8] **Claims 21-32** and **34-38** are rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination between Efficient Use of Local Edge Histogram Descriptor, Proceedings ACM Multimedia 2000 Workshops, 11/4/2000, ACM International Multimedia Conference (hereinafter "Park et al.") in view of Efficient Use of MPEG-7 Edge Histogram Descriptor, vol. 24, no. 1, 2/2002 (hereinafter "Won et al.").

Regarding **claim 21**, while *Park et al.* discloses a method for retrieving a corresponding video sequence ("MPEG-7" at s. 5, p. 53) having a set of image frames ("11639 images" at s. 5, p. 53) of the digital video data ("MPEG-7" at s. 5, p. 53) from a database ("database" at s. 5, p. 53) in response to a query video sequence ("query images" at s. 5, p. 53),

the method comprising the steps of:

a) calculating L representative edge histograms ("edge histogram" at s. 2.2, p. 52; e.g., L being 80 / 5 = 16 as calculated from table 1) of the query video sequence ("query images" at s. 5, p. 53) as an image descriptor ("edge histogram descriptor" at s. 2.2, p. 52) for the query video sequence, wherein each representative edge histogram represents a representative spatial distribution of 5 reference edges (fig. 2a-e) in sub-images of image frames in the query video sequence, wherein the reference edges includes 4 directional edges (fig. 2a-d; "[s]emantics at table 1") and a non-directional edge (fig. 2e);

b) extracting a plurality of image descriptors ("edge histogram descriptor" at s. 1, p. 51) for video sequences based on digital video data information from the database, wherein each image descriptor for said each video sequence includes L representative edge histogram bins ("five histogram bins for each sub-image" at s. 2.3, p. 52; "80 histogram bins" at s. 1, p. 51; table 1) for said each video sequence;

c) comparing the image descriptor ("edge histogram descriptor" at s. 1, p. 51) for the query video sequence ("query images" at s. 5, p. 53) to said each image descriptor ("edge histogram descriptor" at s. 2.2, p. 52) for each video sequences ("MPEG-7" at s. 5, p. 53) to generate a comparison result ("[t]hen, the global, semi-global, and local histograms of two images are compared to evaluate the similarity measure" at abstract), the comparison result indicating a degree of similarity between the query video sequence and the video sequence; and

d) retrieving at least one video sequence based on the comparison results (fig. 8-9; table 2 retrieves at least one video sequence as shown),

Park et al. does not disclose wherein the step b) includes the steps of: b1) retrieving L x 5 quantization index values for each of the target video sequence; b2) converting each of the L x 5 quantization index values into L x 5 representative edge histogram bins for said each target vides sequence by using 5 non-linear inverse quantization tables; and b3) generating L representative edge histograms based on the L x 5 normalized edge histogram bins.

Won et al. teaches wherein the step b) includes the steps of:

b1) retrieving L x 5 quantization index values (table 1 lists 13 x 5, the semantics being the quantization index values) for each of the target video sequence ('images or video" at abstract, p. 23);

b2) converting each of the L x 5 quantization index values into L x 5 representative edge histogram bins (histogram bins listed in table 1) for said each target vides sequence by using 5 non-linear inverse quantization tables ("[t]he normalized 80 bin values are nonlinearly quantized and fixed length coded with 3birts/bin as defined in Table 2. . ." at p. 25); and

b3) generating L number of representative edge histograms (e.g., table 3 generates the L number based on the edge histogram bins) based on the L x 5 normalized edge histogram bins.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the method of *Park et al.* to include wherein the step b) includes the steps of: b1) retrieving L x 5 quantization index values for each of the target video sequence; b2) converting each of the L x 5 quantization index values into L x 5 representative edge histogram bins for said each target vides sequence by using 5 non-linear inverse quantization tables; and b3) generating L number of representative edge histograms based on the L x 5 normalized edge histogram bins as taught by *Won et al.* since "using the local histogram bins only may not be sufficient to

represent global features of the edge distribution. Thus, to improve the retrieval performance, we need global edge distribution as well. This paper describes how to generate the semi-global and global edge histograms from the local histogram bins. Then, the global, semi-global, and local histogram bins are used to evaluate the similarity between images." *Won et al.* at s. I, P. 23.

Regarding **claim 22**, *Park et al.* wherein said each edge histogram has 5 edge histogram bins (e.g., Local-Edge[0] though Local-Edge[4] at table 1) corresponding to the reference edges (the reference edges given in Local-Edge[0] though Local-Edge[4] at table 1; e.g., Vertical edge of sub-image at (0,0)).

Regarding **claim 23**, *Park et al.* discloses wherein the directional edges (fig. 2a-d; "[s]emantics at table 1") include a vertical edge, a horizontal edge, a 45 degree edge, a 135 degree edge and the non-directional edge (*see* "[s]emantics at table 1" for all 5 categories) represents an edge of undesignated direction except for the 4 directional edges.

Regarding **claim 24**, *Park et al.* discloses wherein the step a) includes steps of:

a1) partitioning each image frame of query video sequence into L sub images (e.g., "4 x 4 = 16 sub-images" at s. 2.3, p. 52 wherein 16 = L), wherein each sub-image is further partitioned into S x T image-blocks (s. 3, p. 52; e.g., "image-block" at fig. 3), L, S and T being positive integers;

a2) assigning one of 5 reference edges (one of the five is selected; "for each sub-image, we generate an edge histogram" at s. 2.1, p. 51) to each image-block (s. 3, p. 52; e.g., "image-block" at fig. 3) to thereby generate L edge histograms ("edge histogram" at s. 2.3, p. 52) for each image frame, wherein the edge histograms include M edge histogram bins (e.g., "16x5=80 bins for the edge histogram" at s. 2.3, p. 52) and the reference edges include 4 directional edges and a non-directional edge;

a3) normalizing the edge histogram bins ("normalize each bin in the histogram" at s. 2.4) contained in each edge histogram by S x T to thereby generate M normalized edge histogram bins ("five histogram bins for each sub-image" at s. 2.3, p. 52; "80 histogram bins" at s. 1, p. 51; table 1) for said each image frame;

a4) calculating M representative edge histogram bins (e.g., first five semantics in table 1) of said query video sequence in order to generate L representative edge histograms (edge histogram" at s. 2.2, p. 52) of each video sequence based on the normalized edge histogram bins

("five histogram bins for each sub-image" at s. 2.3, p. 52; "80 histogram bins" at s. 1, p. 51; table 1) of said each image frames

Regarding **claim 25**, *Park et al.* does not disclose wherein the step a2) includes the steps of: a2-1) assigning one of the reference edges to each image block; and a2-2) counting the number of each reference edge included in each sub-image to generate the L number of the edge histograms for the query video sequence.

Won et al. teaches wherein a step a2) includes the steps of:

a2-1) assigning one of the reference edges to each image block ("each image block is classified into one of thee 5 types of edge blocks or a nonedge block" at s. II, p. 25); and a2-2) counting the number of each reference edge included in each sub-image ("[w]ithin each sub-image the edge types are arranged in the following order. . ." at s. II, p. 24) to generate the L number of the edge histograms (e.g., L being 80 / 5 = 16 edge histograms as calculated from table 1) for the query video sequence.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the step a2) of *Park et al.* to include the steps of: a2-1) assigning one of the reference edges to each image block; and a2-2) counting the number of each reference edge included in each sub-image to generate the L number of the edge histograms for the query video sequence as taught by *Won et al.* since "using the local histogram bins only may not be sufficient to represent global features of the edge distribution. Thus, to improve the retrieval performance, we need global edge distribution as well. This paper describes how to generate the semi-global and global edge histograms from the local histogram bins. Then, the global, semi-global, and local histogram bins are used to evaluate the similarity between images. " (*Won et al.* at s. I, P. 23)

Regarding **claim 26**, *Park et al.* in view of *Won et al.* does not disclose wherein the step a2-1) includes the steps of: a2-11) dividing each image-block into 2.times.2 sub-blocks; a2-12) assigning a corresponding filter coefficient to each sub-block; a2-13) calculating a set of 5 edge magnitudes corresponding to five edges for each image-block by using the filter coefficient; and a2-14) expressing the image-block as an edge having a maximum edge magnitude by comparing the calculated edge magnitudes each other.

Won et al. teaches wherein a step a2-1) includes the steps of:

a2-11) dividing each image-block into 2.times.2 sub-blocks (fig. 5);

a2-12) assigning a corresponding filter coefficient (fig. 6a-e) to each sub-block;

a2-13) calculating a set of 5 edge magnitudes ("edge magnitudes. . ." at s. III, p. 25) corresponding to five edges for each image-block by using the filter coefficient (fig. 6a-e); and

a2-14) expressing the image-block (fig. 5 image block) as an edge having a maximum edge magnitude by comparing the calculated edge magnitudes each other ("maximum value among 5 edge strengths. . ." at s. III, p. 26; equation (6) at . 26).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the step a2-1) of *Park et al.* in view of *Won et al.* to include the steps of: a2-11) dividing each image-block into 2.times.2 sub-blocks; a2-12) assigning a corresponding filter coefficient to each sub-block; a2-13) calculating a set of 5 edge magnitudes corresponding to five edges for each image-block by using the filter coefficient; and a2-14) expressing the image-block as an edge having a maximum edge magnitude by comparing the calculated edge magnitudes each other as taught by *Won et al.* since "using the local histogram bins only may not be sufficient to represent global features of the edge distribution. Thus, to improve the retrieval performance, we need global edge distribution as well. This paper describes how to generate the semi-global and global edge histograms from the local histogram bins. Then, the global, semi-global, and local histogram bins are used to evaluate the similarity between images. " (*Won et al.* at s. I, P. 23)

Regarding **claim 27**, *Park et al.* in view of *Won et al.* does not disclose wherein the 5 edge magnitudes are obtained by using 5 equations, which are expressed as:

$$m_v(i,j) = \left| \sum_{k=0}^{3} a_k(i,j) \times f_v(k) \right|;$$

$$m_h(i,j) = \left| \sum_{k=0}^{3} a_k(i,j) \times f_h(k) \right|;$$

$$m_{d-45}(i,j) = \left| \sum_{k=0}^{3} a_k(i,j) \times f_{d-45}(k) \right|;$$

$$m_{d-135}(i,j) = \left| \sum_{k=0}^{3} a_k(i,j) \times f_{d-135}(k) \right|; \text{ and}$$

$$m_{nd}(i,j) = \left| \sum_{k=0}^{3} a_k(i,j) \times f_{nd}(k) \right|,$$ where $m_v(i,j)$, $m_h(i,j)$, $m_{d-45}(i,j)$,

respectively, respectively, denote vertical, horizontal, 45 degree, 135 degree and non-directional edge magnitudes for a $(i,j)^{th}$ image-block; $a_k(i,j)$ denotes an average gray level for a sub-block assigned k in the $(i,j)^{th}$ image-block and $f_v(k)$, $f_h(k)$, $f_{d-45}(k)$, $f_{d-135}(k)$ and $f_{nd}(k)$ denote, respectively, filter coefficients for the vertical, horizontal, 45 degree, 135 degree and non-directional edges where k represents a number assigned to each sub-block.

Won et al. teaches wherein the 5 edge magnitude are obtained by using 5 equations, which are expressed as:

$$m_v(i,j) = \left| \sum_{k=0}^{3} a_k(i,j) \times f_v(k) \right|;$$

$$m_h(i,j) = \left| \sum_{k=0}^{3} a_k(i,j) \times f_h(k) \right|;$$

$$m_{d-45}(i,j) = \left| \sum_{k=0}^{3} a_k(i,j) \times f_{d-45}(k) \right|;$$

$$m_{d-135}(i,j) = \left| \sum_{k=0}^{3} a_k(i,j) \times f_{d-135}(k) \right|; \text{ and}$$

$$m_{nd}(i,j) = \left| \sum_{k=0}^{3} a_k(i,j) \times f_{nd}(k) \right|, \text{ where } m_v(i,j),\ m_h(i,j),\ m_{d-45}(i,j),$$

(equations (1)-(5) at p. 26) respectively, respectively, denote vertical, horizontal, 45 degree, 135 degree and non-directional edge magnitudes for a $(i,j)^{th}$ image-block; $a_k(i,j)$ denotes an average gray level for a sub-block assigned k in the $(i,j)^{th}$ image-block and $f_v(k)$, $f_h(k)$, $f_{d-45}(k)$, $f_{d-135}(k)$ and $f_{nd}(k)$ denote, respectively, filter coefficients for the vertical, horizontal, 45 degree, 135 degree and non-directional edges where k represents a number assigned to each sub-block (last paragraph on p. 25).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the 5 edge magnitudes of *Park et al.* in view of *Won et al.* to be are obtained by using 5 equations, which are expressed as:

$$m_v(i,j) = \left| \sum_{k=0}^{3} a_k(i,j) \times f_v(k) \right|;$$

$$m_h(i,j) = \left| \sum_{k=0}^{3} a_k(i,j) \times f_h(k) \right|;$$

$$m_{d-45}(i,j) = \left| \sum_{k=0}^{3} a_k(i,j) \times f_{d-45}(k) \right|;$$

$$m_{d-135}(i,j) = \left| \sum_{k=0}^{3} a_k(i,j) \times f_{d-135}(k) \right|; \text{ and}$$

$$m_{nd}(i,j) = \left| \sum_{k=0}^{3} a_k(i,j) \times f_{nd}(k) \right|, \text{ where } m_v(i,j),\ m_h(i,j),\ m_{d-45}(i,j),$$

respectively, respectively, denote vertical, horizontal, 45 degree, 135 degree and non-directional edge magnitudes for a $(i,j)^{th}$ image-block; $a_k(i,j)$ denotes an average gray level for a sub-block assigned k in the $(i,j)^{th}$ image-block and $f_v(k)$, $f_h(k)$, $f_{d-45}(k)$, $f_{d-135}(k)$ and $f_{nd}(k)$ denote, respectively, filter coefficients for the vertical, horizontal, 45 degree, 135 degree and non-directional edges where k represents a number assigned to each sub-block as taught by *Won et al.* since "using the local histogram bins only may not be sufficient to represent global features of the edge distribution. Thus, to improve the retrieval performance, we need global edge distribution as well. This paper describes how to generate the semi-global and global edge histograms from the local histogram bins. Then, the global, semi-global, and local histogram bins are used to evaluate the similarity between images. " (*Won et al.* at s. I, P. 23)

Regarding **claim 28**, *Park et al.* in view of *Won et al.* does not disclose wherein the maximum edge magnitude is greater than a predetermined threshold value, otherwise the image block is considered to contain no edge.

Won et al. teaches wherein the maximum edge magnitude is greater than a predetermined threshold value, otherwise the image block is considered to contain no edge ("if the maximum. . .then the image-block is considered. . .[o]therwise, the image-block contains no edge" at p. 26).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the method of *Park et al.* in view of *Won et al.* to include wherein the maximum edge magnitude is greater than a predetermined threshold value, otherwise the image block is considered to contain no edge as taught by *Won et al.* since "using the local histogram bins only may not be sufficient to represent global features of the edge distribution. Thus, to improve the

retrieval performance, we need global edge distribution as well. This paper describes how to generate the semi-global and global edge histograms from the local histogram bins. Then, the global, semi-global, and local histogram bins are used to evaluate the similarity between images. " (*Won et al.* at s. I, P. 23)

Regarding **claim 29**, *Park et al.* does not disclose wherein the image descriptors for the query and target video sequence further include a global edge histogram and R the semi-global histograms based on the L 5 representative edge histogram bins, respectively, R being a positive integer.

Won et al. teaches wherein the image descriptors ("MPEG-7 standard descriptor" at s. II, p. 24) for the query and target video sequence ("ground truth images for each query image" at s. IV, p. 27; e.g., fig. 10 query and target video sequences) further include a global edge histogram ("global edge histogram" at s. IV, p. 27) and R the semi-global histograms based on the L x 5 representative edge histogram bins ("the global edge histogram has 5 bins and each bin value is obtained by . . .bin values of the corresponding edge type of BinCounts[]" at s. IV, p. 27), respectively, R being a positive integer.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the image descriptors for the query and target video sequence of *Park et al.* to further include a global edge histogram and R the semi-global histograms based on the L 5 representative edge histogram bins, respectively, R being a positive integer as taught by *Won et al.* since "using the local histogram bins only may not be sufficient to represent global features of the edge distribution. Thus, to improve the retrieval performance, we need global edge distribution as well. This paper describes how to generate the semi-global and global edge histograms from the local histogram bins. Then, the global, semi-global, and local histogram bins are used to evaluate the similarity between images. " (*Won et al.* at s. I, P. 23)

Regarding **claim 30**, *Park et al.* in view of *Won et al.* does not disclose wherein the global edge histogram represents an edge distribution in a whole space of the query and target video sequences and each semi-global edge histogram represents an edge distribution in a corresponding set of sub-images of the query and target video sequences.

Won et al. teaches wherein the global edge histogram ("semi-global edge histograms" at pp. 26-27) represents an edge distribution in a whole space of the query and target video

sequences ((“edge distribution information for the whole image space and. . ." at pp. 26-27) and each semi-global edge histogram (“semi-global edge histograms" at pp. 26-27) represents an edge distribution (“represents the edge distribution for the whole image space" at p. 27) in a corresponding set of sub-images (e.g., sub-images at fig. 8) of the query and target video sequences.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the global edge histogram of *Park et al.* in view of *Won et al.* to include an edge distribution in a whole space of the query and target video sequences and each semi-global edge histogram represents an edge distribution in a corresponding set of sub-images of the query and target video sequences as taught by *Won et al.* since “using the local histogram bins only may not be sufficient to represent global features of the edge distribution. Thus, to improve the retrieval performance, we need global edge distribution as well. This paper describes how to generate the semi-global and global edge histograms from the local histogram bins. Then, the global, semi-global, and local histogram bins are used to evaluate the similarity between images. “ (*Won et al.* at s. I, P. 23)

Regarding **claim 31**, *Park et al.* in view of *Won et al.* does not disclose wherein said N and R are 4 and 13, respectively.

Won et al. teaches wherein N and R are 4 (each segment for semi-global histograms has four sub-images as shown in fig. 8; 4 sub-blocks at fig. 5) and 13 (“13 different subsets of the image-blocks” at p. 27; fig. 8), respectively.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the method of *Park et al.* in view of *Won et al.* to include wherein said N and R are 4 and 13, respectively as taught by *Won et al.* since “using the local histogram bins only may not be sufficient to represent global features of the edge distribution. Thus, to improve the retrieval performance, we need global edge distribution as well. This paper describes how to generate the semi-global and global edge histograms from the local histogram bins. Then, the global, semi-global, and local histogram bins are used to evaluate the similarity between images. “ (*Won et al.* at s. I, P. 23).

Regarding **claim 32**, *Park et al.* in view of *Won et al.* does not disclose wherein each of the 13 semi-global edge histograms is generated for each of 13 sets of 4 sub-images, wherein the

13 sets include: four sets of 4 sub-images, each set including 4 sub-images in each of first to fourth columns of the image in vertical direction; four sets of 4 sub-images, each set including 4 sub-images in each of first to fourth rows in horizontal direction; four sets of 4 sub-images, each set including a corresponding sub-image and 3 sub-images neighboring the corresponding sub-image, wherein the corresponding sub-image is respectively located on the left-top, on the right-top, on the left-bottom and on the right-bottom of the image; and a set including 4 sub-images around the center of the image.

Won et al. teaches wherein each of the 13 semi-global edge histograms (the 13 shown in fig. 8) is generated for each of 13 sets of 4 sub-images (each segment for semi-global histograms has four sub-images), wherein the 13 sets include:

four sets of 4 sub-images, each set including 4 sub-images in each of first to fourth columns of the image in vertical direction (left-most figure at fig. 8);

four sets of 4 sub-images, each set including 4 sub-images in each of first to fourth rows in horizontal direction (middle figure at fig. 8);

four sets of 4 sub-images, each set including a corresponding sub-image and 3 sub-images neighboring the corresponding sub-image, wherein the corresponding sub-image is respectively located on the left-top, on the right-top, on the left-bottom and on the right-bottom of the image; and a set including 4 sub-images around the center of the image (right-most figure at fig. 8).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the method of *Park et al.* in view of *Won et al.* to include wherein each of the 13 semi-global edge histograms is generated for each of 13 sets of 4 sub-images, wherein the 13 sets include: four sets of 4 sub-images, each set including 4 sub-images in each of first to fourth columns of the image in vertical direction; four sets of 4 sub-images, each set including 4 sub-images in each of first to fourth rows in horizontal direction; four sets of 4 sub-images, each set including a corresponding sub-image and 3 sub-images neighboring the corresponding sub-image, wherein the corresponding sub-image is respectively located on the left-top, on the right-top, on the left-bottom and on the right-bottom of the image; and a set including 4 sub-images around the center of the image as taught by *Won et al.* since "using the local histogram bins only may not be sufficient to represent global features of the edge distribution. Thus, to improve the

retrieval performance, we need global edge distribution as well. This paper describes how to generate the semi-global and global edge histograms from the local histogram bins. Then, the global, semi-global, and local histogram bins are used to evaluate the similarity between images. " (*Won et al.* at s. I, P. 23).

Regarding **claim 34**, *Park et al.* in view of *Won et al.* does not disclose wherein the step b) further includes the step of: b4) further generating a global edge histogram and R semi-global histograms for each of the target video sequence based on the L x 5 representative edge histogram bins.

Won et al. teaches wherein the step b) further includes the step of:

b4) further generating a global edge histogram ("global edge histogram" at p. 27) and R semi-global histograms (e.g., "semi-global edge histograms of image A and image B, respectively" at p. 27) for each of the target video sequence based on the L x 5 representative edge histogram bins (equation (7) at p .27).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the step b) of *Park et al.* in view of *Won et al.* to include the step of: b4) further generating a global edge histogram and R semi-global histograms for each of the target video sequence based on the L x 5 representative edge histogram bins as taught by *Won et al.* since "using the local histogram bins only may not be sufficient to represent global features of the edge distribution. Thus, to improve the retrieval performance, we need global edge distribution as well. This paper describes how to generate the semi-global and global edge histograms from the local histogram bins. Then, the global, semi-global, and local histogram bins are used to evaluate the similarity between images. " (*Won et al.* at s. I, P. 23).

Regarding **claim 35**, claim 33 recites identical features as in claim 35. Thus, references/arguments equivalent to those presented above for claim 33 are equally applicable to claim 35.

Regarding **claim 36**, claim 34 recites identical features as in claim 36. Thus, references/arguments equivalent to those presented above for claim 34 are equally applicable to claim 36.

Regarding **claim 37**, *Park et al.* in view of *Won et al.* does not disclose wherein the step c) includes the step of: estimating a distance between the query video sequence and said each target video sequence by equation as:

$$Distance(A,B) = \sum_{i=0}^{79} |Local\_A[i] - Local\_B[i]| + 5 \times \sum_{i=0}^{4} |Global\_A[i] - Global\_B[i]|$$
$$+ \sum_{i=0}^{64} |Semi\_Global\_A[i] - Semi\_Global\_B[i]|$$

where Local_A[i] and Local_B[i] denote, respectively, the edge histogram bins of BinCount[i] of the query video sequence A and the target video sequence B; Global_A[ ] and Global_B[ ] denote, respectively, the edge histogram bins for the global edge histograms of the query image A and the target image B; and Semi_Global_A[ ] and Semi_Global_B[ ] denote, respectively, the histogram bin values for the semi-global edge histogram bins of the query video sequence A and the target video sequence B.

Won et al. teaches wherein the step c) includes the step of:

estimating a distance between the query video sequence and said each target video sequence by equation as:

$$Distance(A,B) = \sum_{i=0}^{79} |Local\_A[i] - Local\_B[i]| + 5 \times \sum_{i=0}^{4} |Global\_A[i] - Global\_B[i]|$$
$$+ \sum_{i=0}^{64} |Semi\_Global\_A[i] - Semi\_Global\_B[i]|$$

where Local_A[i] and Local_B[i] denote, respectively, the edge histogram bins of BinCount[i] of the query video sequence A and the target video sequence B; Global_A[ ] and Global_B[ ] denote, respectively, the edge histogram bins for the global edge histograms of the query image A and the target image B; and Semi_Global_A[ ] and Semi_Global_B[ ] denote, respectively, the histogram bin values for the semi-global edge histogram (p. 27, left column; equation (7), p. 27)

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the step c) of *Park et al.* in view of *Won et al.* to include the step of: estimating a distance between the query video sequence and said each target video sequence by equation as:

$$Distance(A,B) = \sum_{i=0}^{79} | Local\_A[i] - Local\_B[i] | + 5 \times \sum_{i=0}^{4} | Global\_A[i] - Global\_B[i] |$$
$$+ \sum_{i=0}^{64} | Semi\_Global\_A[i] - Semi\_Global\_B[i] |$$

where Local_A[i] and Local_B[i] denote, respectively, the edge histogram bins of BinCount[i] of the query video sequence A and the target video sequence B; Global_A[ ] and Global_B[ ] denote, respectively, the edge histogram bins for the global edge histograms of the query image A and the target image B; and Semi_Global_A[ ] and Semi_Global_B[ ] denote, respectively, the histogram bin values for the semi-global edge histogram bins of the query video sequence A and the target video sequence B as taught by *Won et al.* since "using the local histogram bins only may not be sufficient to represent global features of the edge distribution. Thus, to improve the retrieval performance, we need global edge distribution as well. This paper describes how to generate the semi-global and global edge histograms from the local histogram bins. Then, the global, semi-global, and local histogram bins are used to evaluate the similarity between images. " (*Won et al.* at s. I, P. 23).

Regarding **claim 38**, claim 37 recites identical features as in claim 38. Thus, references/arguments equivalent to those presented above for claim 37 are equally applicable to claim 38.

Conclusion

[9] Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

[10] Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID P. RASHID whose telephone number is (571)270-1578 and fax number (571)270-2578. The examiner can normally be reached Monday - Friday 7:30 - 17:00 ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (571) 272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David P. Rashid/
Examiner, Art Unit 2624

/Bhavesh M Mehta/
Supervisory Patent Examiner, Art Unit 2624

David P Rashid
Examiner
Art Unit 26244